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AF
PATENT 2831

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:)	Docket No: LAM2P322
)	
Nakajima et al.)	Group Art Unit: 2831
)	
Application No: 10/030,592)	Examiner: Harris, Anton B.
)	
Filed: May 21, 2002)	Date: November 29, 2004
)	
For: ELECTROSTATIC CHUCK AND ITS)	
MANUFACTURING METHOD)	

CERTIFICATE OF MAILING

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**TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION -- 37 CFR 192)**

Commissioner for Patents
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Alexandria, VA 22313-1450

Sir:

This Appeal Brief is in furtherance of the Notice of Appeal filed in this case on August 23, 2004. The Notice of Appeal was received by the USPTO on August 27, 2004. A 1-month extension of time is requested herein, extending the deadline for filing this Appeal Brief to November 27, 2004. November 27, 2004 fell on a Saturday, and therefore, the due date for this Appeal Brief is November 29, 2004. This Appeal Brief is transmitted in triplicate:

This application is on behalf of:

☐ Small Entity ☒ Large Entity

Pursuant to 37 CFR 1.17(f), the fee for filing the Appeal Brief is:

☐ \$170.00 (Small Entity) ☒ \$340.00 (Large Entity)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply:

Attorney Docket No.: LAM2P322

☒ Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

<u>Months</u>	<u>Large Entity</u>	<u>Small Entity</u>
<input checked="" type="checkbox"/> one	\$110.00	\$55.00
<input type="checkbox"/> two	\$430.00	\$215.00
<input type="checkbox"/> three	\$980.00	\$490.00

☒ If an additional extension of time is required, please consider this a petition therefor.

☐ An extension for __ months has already been secured and the fee paid therefor of \$ is deducted from the total fee due for the total months of extension now requested.

☐ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that Applicant has inadvertently overlooked the need for a petition and fee for extension of time.


Total Fees Due:

Notice of Appeal Fee	<u>\$340.00</u>
Extension Fee (if any)	<u>\$110.00</u>
Total Fee Due	<u>\$450.00</u>

☒ Enclosed is Check No. 12963 in the amount of \$450.00.

☒ Charge any additional fees or credit any overpayment to Deposit Account No. 50-0850, (Order No. LAM2P322). Two copies of this transmittal are enclosed.

Respectfully submitted,
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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

EX PARTE NAKAJIMA ET AL.

Application for Patent

Filed May 21, 2002

Application No. 10/030,592

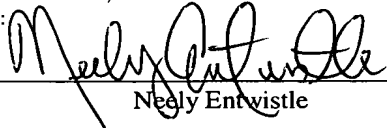
FOR:

ELECTROSTATIC CHUCK AND ITS MANUFACTURING METHOD

APPEAL BRIEF

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Neely Entwistle

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Attorneys for Applicant**

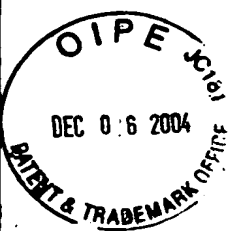


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APPENDIX A - CLAIMS ON APPEAL



I. REAL PARTY IN INTEREST

The real party in interest is Lam Research Corporation, the assignee of the present application.

II. RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any related appeals and/or interferences.

III. STATUS OF THE CLAIMS

A total of 8 claims were presented during prosecution of this application. The Applicant appeals rejected claims 1-8.

IV. STATUS OF THE AMENDMENTS

The application was originally filed on May 21, 2002. All amendments have been entered, leaving rejected claims 1-8.

V. SUMMARY OF THE INVENTION

Figure AB-1 (Figure 1) is an illustration showing a cross-sectional view of an electrostatic chuck, in accordance with one embodiment of the present invention. In the electrostatic chuck, a disc-shaped ceramic layer 80 having a predetermined thickness is bonded onto a disc-shaped metal base plate 60 by means of an adhesive layer 70. (p. 8, last ¶) In the ceramic layer 80, a planar electrode 90 made of tungsten, for example, is disposed to be parallel to a surface of the ceramic layer 80. (p. 8, last ¶) The electrode 90 is formed in the ceramic layer 80 at a depth of one half of the thickness of the ceramic layer 80, i.e., in the middle of the ceramic layer 80 in the thickness direction. (p. 8, last ¶)

Further with respect to Figure AB-1, a cooling gas channel 81 is formed on a surface of the ceramic layer 80. (p. 9, last ¶) The cooling gas channel 81 is formed in a ring shape along the outer periphery of the ceramic layer 80. (p. 10, first partial ¶) The cooling gas channel 81 is also formed within the outer periphery of the electrode 90 and over the electrode 90, as shown in Figure AB-1. (p. 11, first full ¶) Accordingly, the electrode 90 passes under the bottom of the channel 81 and extends beyond the channel 81 to the vicinity of the outer periphery of the ceramic layer 80. (p. 11, first full ¶) Thus, the electrode 90 extends beyond the cooling gas channel 81 to a gas-sealed region. (p. 11, first full ¶) Therefore, electrostatic attraction is applied to the gas-sealed region by means of the electrode 90 as indicated by arrows in Figure AB-1. (p. 11, first full ¶) The electrostatic attraction in the gas-sealed region prevents cooling gas leakage from the gas-sealed region. (p. 11, first full ¶) Prevention of cooling gas leakage leads to improved cooling of the semiconductor wafer W. (p. 11, first full ¶) Improved cooling of the semiconductor wafer W leads to improved etching characteristics, such as center-to-edge uniformity as measured on the wafer. (p. 11, first full ¶)

Figure AB-2 (Figure 3) is an illustration showing a top plan view of the electrostatic chuck, in accordance with one embodiment of the present invention. (p. 10, first partial ¶) As shown in Figure AB-2, gas feed orifices 82 are provided at a number of positions at the bottom of the cooling gas channel 81. (p. 10, first full ¶) Additionally, gas feed orifices 83 are arranged in a number of positions on a surface of the ceramic layer 80 near the center of the electrostatic chuck. (p. 10, first full ¶) The gas feed orifices 82 and 83 extend through the ceramic layer 80, the adhesive layer 70, and through to the bottom of the base plate 60. (p. 10, first full ¶) A cooling gas such as a helium gas, for example, is fed from the bottom of the base plate 60. (p. 10, first full ¶) The helium gas is emitted from the gas feed orifices 82 and 83 in the bottom of the channel 81 and near the surface of the

ceramic layer 80. (p. 10, first full ¶) The helium gas diffuses from the gas feed orifices 82 and 83 over the entire interface between the ceramic layer 80 and the semiconductor wafer W, as shown in Figure AB-1, so as to cool the semiconductor wafer W. (p. 10, first full ¶)

Figure AB-3 (Figure 2) is an illustration showing a top plan view of the electrode 90, in accordance with one embodiment of the present invention. (p. 9, first full ¶) The electrode 90 includes a first electrode 91 and a second electrode 92. (p. 9, first full ¶) The first electrode 91 includes a disc portion 91a arranged in the center of the ceramic layer 80, and a linear portion 91b linearly extending from a part of the disc portion 91a toward an outer peripheral edge of the ceramic layer 80. (p. 9, first full ¶) The first electrode 91 further includes a plurality of "C-shaped" ring portions 91c at predetermined intervals having different diameters and extending in "C" shapes on both sides of the linear portion 91b so as to surround the disc portion 91a. (p. 9, first full ¶) The second electrode 92 includes a linear portion 92b positioned opposite to the linear portion 91b of the first electrode 91, beyond the disc portion 91a of the first electrode 91, and arranged complementary to the plurality of the C-shaped ring portions 91c of the first electrode 91. (p. 9, first full ¶) The second electrode 92 also includes a plurality of "C-shaped" ring portions 92c extending in C-shapes on both sides of the linear portion 92b, and being engaged with the plurality of the C-shaped ring portions 91c of the first electrode 91. (p. 9, first full ¶) Furthermore, the electrode 91 comprises a circular ring portion 92d connected to an outer edge of the linear portion 92b so as to form an outermost peripheral portion of the electrode. (p. 9, first full ¶)

In the electrostatic chuck as described above, the electrode 90 is defined by a high-melting point metal having a coefficient of linear thermal expansion different from that of the ceramic layer 80. (p. 10, last ¶) Also, the electrode 90 is disposed in the middle of the ceramic layer 80 relative to the thickness direction of the ceramic layer 80. (p. 10, last ¶)

Therefore, even if the ceramic layer 80 is formed by firing, the electrode 90 within the ceramic layer 80 does not cause the ceramic layer 80 to warp. (p. 11, first partial ¶) Thus, the ceramic layer 80 retains a flat surface for interfacing with the wafer W. (p. 11, first partial ¶) Retaining the flatness of the ceramic layer 80 leads to improvement of etching characteristics, e.g., uniformity, and increased attraction of the semiconductor wafer W to the electrostatic chuck. (p. 11, first partial ¶)

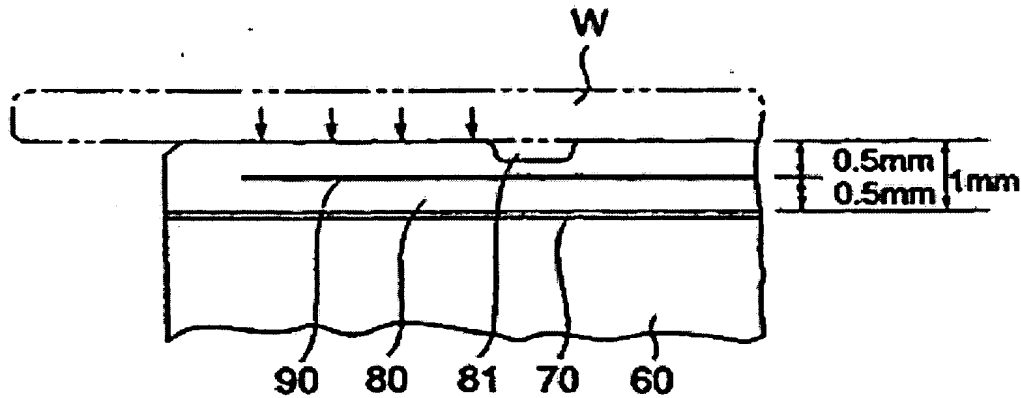


Fig. AB-1

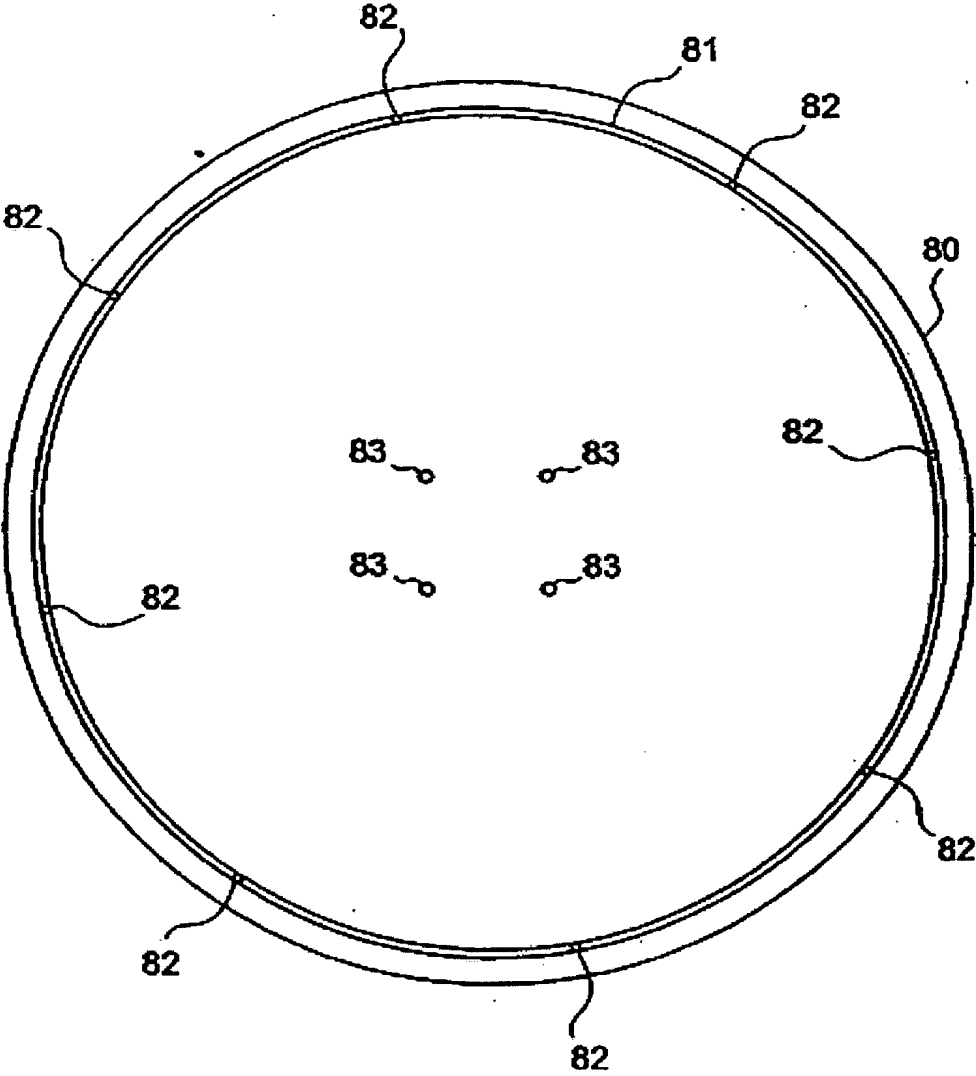


Fig. AB-2

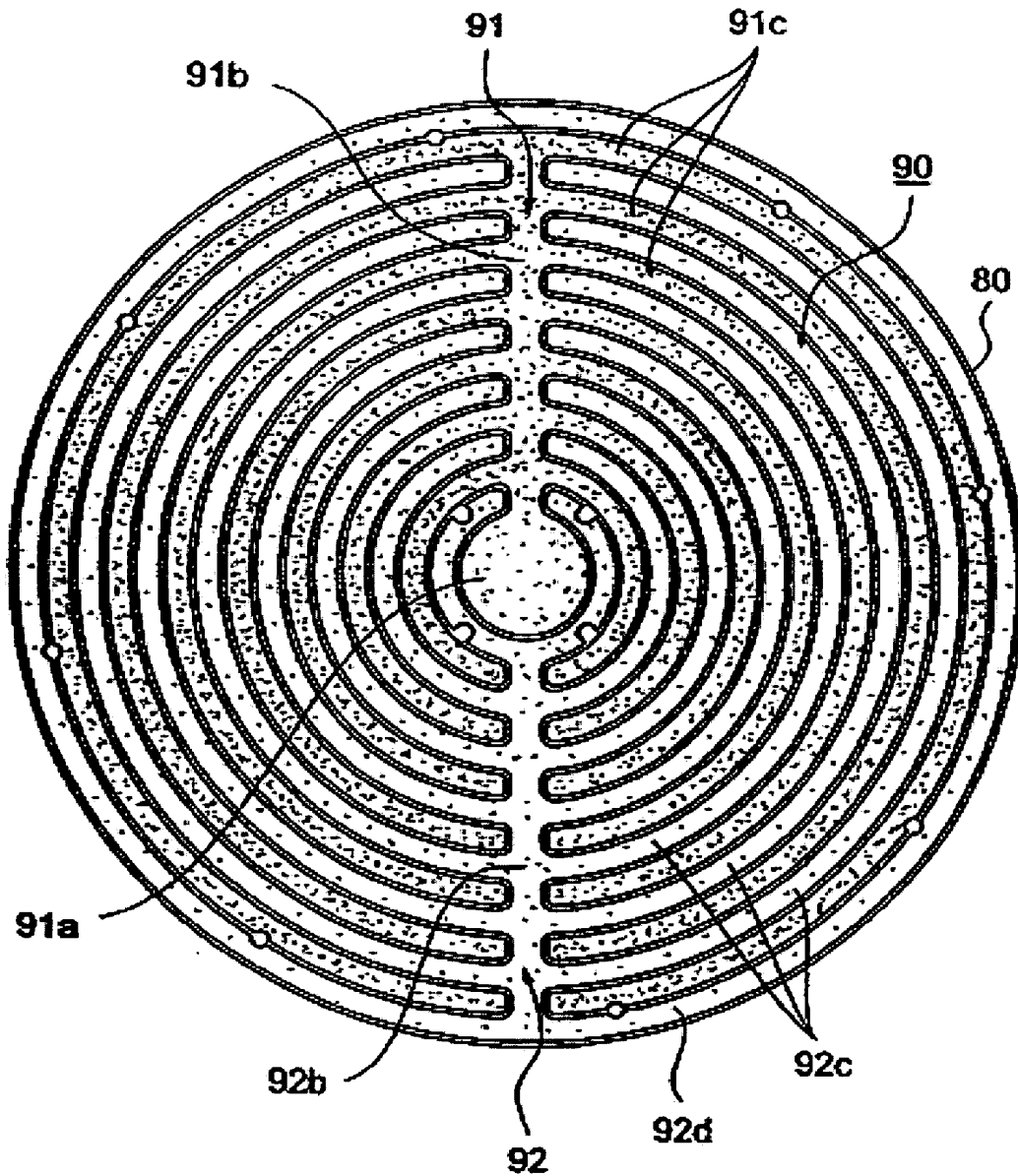


Fig. AB-3

VI. ISSUES

The issues presented in this appeal are whether the rejections under 35 U.S.C. §103 of the claims under appeal are proper. The issues therefore are as follows:

- A. Are claims 1-8 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Logan et al. ("Logan" hereafter) (U.S. Patent No. 5,055,964) in view of Sun et al. ("Sun" hereafter) (U.S. Patent No. 5,788,814)?

VII. GROUPING OF THE CLAIMS

The applicant proposes two groups of claims. The first group (Group I) includes claims 1-6. The claims of the first group stand or fall together. The second group (Group II) includes claims 7-8. The claims of the second group stand or fall together.

VIII. ARGUMENTS

- A. The references as relied upon by the Examiner, either separately or in combination, do not motivate or suggest to one of ordinary skill in the art at the time of the invention to combine the reference teachings in a manner that would render the invention as recited in claims 1-6 (Group I) prima facie obvious.

Rejection

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

With regard to claim 1, the Examiner's position is as follows:

"It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Logan et al. by providing a ceramic disk in order to support a plurality of subjects in view of the teachings of Sun et al."

Applicant's Rebuttal

Claim 1 represents the broadest independent claim of Group I (i.e., claims 1-6). Since the claims of Group I will stand or fall together, the Applicant chooses to argue the patentability of claim 1. Therefore, the arguments presented in this section (Section VIII.A.) are directed to claim 1.

The Examiner has relied upon Logan to teach each feature of claim 1 with the exception of a ceramic disk. The Examiner has relied upon Sun to teach the ceramic disk as recited in claim 1. For reasons discussed in Section VIII.B., the Applicants submit that Logan and Sun do not teach the features of claim 1 as asserted by the Examiner. Additionally, the Applicants submit that there is no motivation or suggestion to combine the teachings of Logan and Sun.

The teachings of Sun, as related to a ceramic disk, have no relevance to the teachings of Logan or to the presently claimed invention. More specifically, Sun (column 21, lines 32-34) teaches that the chuck of Sun can be used to hold a substrate for application of a pharmaceutically active ingredient. Sun (column 21, lines 38-39) states that substrates can include dressings, bandages and patches, or a container for an inhaler. Sun (column 21, lines 39-41) discloses that the inhaler can be a flat, ceramic disc upon which a plurality of medicament dosages are positioned. The inhaler, i.e., ceramic disc, of Sun refers to a portion of a substrate to be held by a chuck. The Applicants submit that neither Sun nor Logan provide any suggestion or motivation to interpret the inhaler, i.e., ceramic disc, of Sun as being relevant to the present invention as embodied in claim 1. In particular, there is no suggestion or motivation to combine the inhaler component of Sun with the teachings of Logan in a manner that would teach or suggest the ceramic disc feature of claim 1, particularly wherein the ceramic disc of claim 1 includes the following features:

- having a predetermined thickness
- being adhesively bonded to a metal base plate
- having a planar electrode positioned in the middle thereof
- having a cooling gas channel formed on a top surface thereof.

For at least the reasons provided above, the Applicants submit that there is no suggestion or motivation, either explicitly or implicitly, in either Logan or Sun to have combined their respective teachings to arrive at the present invention as embodied in claim 1. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. MPEP §2143.01

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. MPEP §2143.01 However, the level of ordinary skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999). A statement that modifications of the prior art to meet the claimed invention would have been within the ordinary skill of the art at the time the claimed invention was made is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The rationale for combining references requires a recognition either expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles

or legal precedent, that some advantage or expected beneficial result would have been produced by the combination of references. *In re Sernaker*, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983). The Applicants submit that the motivation to combine the teachings of Logan and Sun as suggest by the Examiner is not drawn from a convincing line of reasoning based on established scientific principles or legal precedent.

In view of the foregoing, the Board of Appeals and Interferences ("Board" hereafter) is respectfully requested to overrule the Examiner's rejections of claims 1-6 under 35 U.S.C. §103.

- B. The combination of Logan and Sun, as relied upon by the Examiner, fail to teach or suggest all features recited in each of claims 1-6 (Group I) as required to establish a prima facie case of obviousness.

Rejection

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

With regard to claim 1, the Examiner's position is as follows:

"Regarding claim 1, Logan et al. (col. 3 line 39-col. 4 line 59) discloses an electrostatic chuck, comprising:

a metal base plate 26:

a layer 28 having a predetermined thickness adhesively bonded to the metal base plate

a planar electrode 12 positioned in the middle of the layer 28 relative to a thickness direction of the layer; and

a cooling gas channel 42 is formed on a top surface of the layer over the electrode 12 and within an outer peripheral edge of the electrode 16, but lacks a ceramic disc.

Sun et al. (col. 21, line 40) teaches a ceramic disc."

Applicant's Rebuttal

Claim 1 represents the broadest independent claim of Group I (i.e., claims 1-6). Since the claims of Group I will stand or fall together, the Applicant chooses to argue the patentability of claim 1. Therefore, the arguments presented in this section (Section VIII.B.) are directed to claim 1.

The Examiner has relied upon Logan to disclose each required feature of claim 1 with the exception of a ceramic disc. In addition, the Examiner has relied upon Sun to disclose the ceramic disc. In order to respond to the combination of Logan and Sun as applied by the Examiner, it is necessary for the Applicants to address each feature of the presently claimed invention on an individual basis with respect to the specific cited art that is being applied against the particular feature. Therefore, the Applicants respectfully submit that the following arguments should not be viewed as attacking references individually.

The Applicants submit that the combination of Logan and Sun fails to teach or suggest each and every feature of claim 1 as required to establish a prima facie case of obviousness. More specifically, the Examiner has relied upon Logan (item 26) to disclose a metal base plate. However, Logan (item 26) refers to a top surface of the complete electrostatic chuck assembly rather than a metal base plate.

The Examiner has relied upon Logan (item 28) to disclose a ceramic disc having a predetermined thickness adhesively bonded to the metal base plate. However, the Examiner has cited Logan (item 28) as teaching "a layer" having a predetermined thickness adhesively bonded to the metal base plate, with an inference that the "layer" corresponds to the ceramic disk of claim 1. Additionally, the Examiner has admitted, in contradiction to the "layer" assertions, that Logan does not disclose a ceramic disc. Notwithstanding the

fact that Logan does not teach a ceramic disc, Logan (item 28) refers to an insulator coating used to coat each of two electrode portions, wherein the two electrode portions are adhesively bonded to each other. Thus, the Examiner has inferred that the insulator coating (item 28 of Logan), is equivalent to the ceramic disc of claim 1. Logan (column 3, lines 62-64) discloses that the insulator coating, (item 28) is a coating used to coat electrodes. When considering claim 1 in view of the specification, the Applicants respectfully submit that the insulator coating of Logan is neither equivalent to nor suggestive of the ceramic disc required by claim 1. Furthermore, since the electrodes disclosed by Logan (Figure 2, Items 12 and 14) are not disc-shaped, it is not reasonable to conclude that the insulator coating (item 28 of Logan) used to coat those electrodes will be disc-shaped. Therefore, the insulator coating of Logan (item 28) does not suggest a ceramic disc having a predetermined thickness adhesively bonded to the metal base plate, as required by claim 1 of the present invention.

The Examiner has relied upon Logan (item 12) to disclose a planar electrode positioned in the middle of the ceramic disc relative to a thickness direction of the ceramic disc, wherein the ceramic disc is asserted to be disclosed by the insulator coating (item 28 of Logan). As previously discussed, the insulator coating (item 28) of Logan does not teach or suggest a ceramic disc as required by claim 1. Additionally, claim 1 requires that a planar electrode be positioned in the middle of the ceramic disc relative to a thickness direction of the ceramic disc. As evidenced by Figure 2 of Logan and associated text, the Applicants submit that the electrode of Logan (item 12) is not planar. Also, since Logan does not disclose a ceramic disc, it is not possible for Logan to disclose a planar electrode positioned in the middle of the ceramic disc as required by claim 1.

The Examiner has relied upon Logan (item 42) to disclose a cooling gas channel formed on a top surface of the ceramic disc over the electrode and within the outer

peripheral edge of the electrode. Logan (item 42) does refer to a cooling channel. However, the cooling channel of Logan (item 42) is located in a bottom surface of a support (item 44) wherein electrodes (items 12 and 14) are positioned above the support. In contrast to the disclosure of Logan, claim 1 requires a cooling gas channel to be formed on a top surface of the ceramic disc, over the electrode, and within an outer periphery edge of the electrode. Logan simply does not disclose a cooling gas channel having characteristics as required by claim 1. Also, since Logan does not disclose a ceramic disc having the required characteristics of claim 1, as previously discussed, it is not possible for Logan to disclose a cooling gas channel formed on a top surface of the ceramic disc of claim 1.

The Examiner has relied upon Sun (column 21, line 40) to teach the ceramic disc of claims 1-6. The Applicants respectfully submit, however, that the ceramic disc referenced in the cited portion of Sun has no relevance to the presently claimed invention. To be more specific, Sun (column 21, lines 32-34) teaches that the chuck of Sun can be used to hold a substrate for application of a pharmaceutically active ingredient. Sun (column 21, lines 38-39) states that substrates can include dressings, bandages and patches, or a container for an inhaler. Sun (column 21, lines 39-41) discloses that the inhaler can be a flat, ceramic disc upon which a plurality of medicament dosages are positioned. Therefore, the ceramic disc of Sun as referenced by the Examiner refers to a portion of a substrate to be held by a chuck.

In contrast to Sun, the ceramic disc of the present invention is part of an electrostatic chuck. Furthermore, with respect to claim 1, the ceramic disc of the present invention is required to be adhesively bonded to a metal base plate. Also, claim 1 requires a planar electrode to be positioned in the middle of the ceramic disc. Additionally, claim 1 requires a cooling gas channel to be formed on a top surface of the ceramic disc. Neither

Sun, Logan, nor the combination thereof, suggest a ceramic disc having the above characteristics.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In accordance with foregoing arguments, the Applicants respectfully submit that the combination of Logan and Sun fails to teach or suggest each and every feature of claim 1 as required to support a rejection under 35 U.S.C. §103(a). Therefore, the Applicants submit that claim 1 is patentable over the cited art of record.

In view of the foregoing, the Board is respectfully requested to overrule the Examiner's rejections of claims 1-6 under 35 U.S.C. §103.

- C. The features recited in each of claims 1-6 (Group I) have not been properly considered as a whole.

Rejection

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

In the interest of minimizing repetitive discussion, the Board is respectfully requested to refer to the Examiner's Position in Section VIII.B for the present Examiner's Position.

Applicant's Rebuttal

Claim 1 represents the broadest independent claim of Group I (i.e., claims 1-6). Since the claims of Group I will stand or fall together, the Applicant chooses to argue the patentability of claim 1. Therefore, the arguments presented in this section (Section VIII.C.) are directed to claim 1.

The Examiner has relied upon Logan to disclose each required feature of claim 1 with the exception of a ceramic disc. In addition, the Examiner has relied upon Sun to disclose the ceramic disc as recited in claim 1. Thus, in applying the combination of Logan and Sun, the Examiner has disassembled claim 1 by separating the ceramic disc from other recited features that serve to further define the ceramic disc. The Applicants respectfully submit that in considering the ceramic disc separately from other features of claim 1, the Examiner has not considered claim 1 as whole, as required to establish a case of prima facie obviousness.

The Applicants submit that the Examiner has attempted to attack the recited features of claim 1, particularly the characterizing features of the ceramic disc, in a piecemeal manner without considering the claimed invention as a whole. In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983). Therefore, the Examiner must consider all features of the claimed invention. Furthermore, "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Thus, the characterizing features of the ceramic disc of claim 1 should not be considered separately from the ceramic disc itself, or the presence thereof, when judging the patentability of claim 1 against the cited art of record.

In view of the foregoing, the Board is respectfully requested to overrule the Examiner's rejections of claims 1-6 under 35 U.S.C. §103.

- D. The references as relied upon by the Examiner, either separately or in combination, do not motivate or suggest to one of ordinary skill in the art at the time of the invention to combine the reference teachings in a manner that would render the invention as recited in claims 7-8 (Group II) *prima facie* obvious.

Rejection

Claims 7-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

With regard to claim 7, the Examiner has stated the following:

"Furthermore regarding claims 7 and 8, the methods disclosed therein are deemed as inherent in the assembly of the apparatus as claimed as fully met by the above reference Logan et al. and are subsequently rejected."

Applicant's Rebuttal

Claim 7 represents the broadest independent claim of Group II (i.e., claims 7-8). Since the claims of Group II will stand or fall together, the Applicant chooses to argue the patentability of claim 7. Therefore, the arguments presented in this section (Section VIII.D.) are directed to claim 7.

In one instance, the Examiner has indicated that claim 7 is rejected over Logan in view of Sun. However, in another instance, as indicated in the Examiner's Position immediately above, the Examiner has indicated that claim 7 is rejected on the basis of Logan alone. The Applicants submit that the Examiner's Position as expressed immediately above is at a minimum confusing and requiring of interpretation. Due to the Examiner's reference to the "apparatus as claimed" and the fact that claim 1 is the only pending independent apparatus claim, the Applicants assume that the Examiner's intent is to reject claim 7 over Logan in view of Sun as applied to claim 1. Accordingly, the Applicants

assume that the Examiner's statement of motivation for combining the teachings of Logan and Sun with respect to claim 7 is the same as applied to claim 1.

In the interest of minimizing repetitive discussion, the Board is respectfully requested to refer to Section VIII.A for the Applicant's Rebuttal to the Examiner's Position of the present section. For at least the reasons provided in Section VIII.A., the Applicants submit that there is no suggestion or motivation, either explicitly or implicitly, in either Logan or Sun to have combined their respective teachings to arrive at the present invention as embodied in claim 7.

In view of the foregoing, the Board is respectfully requested to overrule the Examiner's rejections of claims 7-8 under 35 U.S.C. §103.

- E. The Examiner's has not properly communicated the basis for rejecting claims 7-8 (Group II).

Rejection

Claims 7-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

In the interest of minimizing repetitive discussion, the Board is respectfully requested to refer to Section VIII.F below for a statement of the Examiner's Position regarding claim 7. Also, the Board is requested to note that the Examiner has rejected claims 7-8 over Logan in view of Sun.

Applicant's Rebuttal

Claim 7 represents the broadest independent claim of Group II (i.e., claims 7-8). Since the claims of Group II will stand or fall together, the Applicant chooses to argue the patentability of claim 7. Therefore, the arguments presented in this section (Section VIII.E.) are directed to claim 7.

The Examiner has indicated that claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. However, in the Examiner's discussion associated with the rejection of claim 7, the Examiner has not indicated how the Sun reference is relied upon to reject claim 7. The Examiner only discusses how the Logan reference is asserted against claim 7. The Examiner has admitted that Logan does not teach a ceramic disc. Therefore, if the Examiner does intend to rely solely on Logan to reject claim 7, the Applicants submit that Logan does not teach the operational features of the method of claim 7 as they relate to either the first disc-shaped ceramic material compact, the second disc-shaped ceramic material compact, or the completed ceramic layer. Otherwise, if the Examiner relies upon both Logan and Sun to support the rejection of claim 7, the Applicants submit that the Examiner has not sufficiently communicated how the Sun reference pertains to the rejection of claim 7.

Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. *In re Hoch*, 428 F.2d 1341, 1342 n.3 166 USPQ 406, 407 n. 3 (CCPA 1970). It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given a fair opportunity to reply. MPEP §706.02(j)

In view of the foregoing, the Board is respectfully requested to overrule the Examiner's rejections of claims 7-8 under 35 U.S.C. §103.

- F. The combination of Logan and Sun, as relied upon by the Examiner, fail to teach or suggest all features recited in each of claims 7-8 (Group II) as required to establish a prima facie case of obviousness.

Rejection

Claims 7-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Logan in view of Sun. These rejections are traversed.

Examiner's Position

With regard to claim 7, the Examiner's position is as follows:

"Logan (col. 3 line 39-col. 4 line 59) discloses a first disc-shaped ceramic material compact having a half of a thickness of a completed ceramic layer 28; forming an electrode 12 on a surface of the first ceramic material compact; preparing a second disc-shaped ceramic material compact having a half of a thickness of the completed ceramic layer and having a cooling gas channel 42 on its surface in a location overlying the electrode;

placing said second ceramic material compact on the first ceramic material compact so as to form a laminate;

firing the entire laminate to form the completed layer 28; and

bonding the completed ceramic layer 28 to a metal base plate 26 by means of an adhesive layer.

Furthermore, regarding claims 7 and 8, the methods disclosed therein are deemed as inherent in the assembly of the apparatus as claimed as fully met by the above reference Logan et al. and are subsequently rejected."

Applicant's Rebuttal

Claim 7 represents the broadest independent claim of Group II (i.e., claims 7-8). Since the claims of Group II will stand or fall together, the Applicant chooses to argue the patentability of claim 7. Therefore, the arguments presented in this section (Section VIII.F.) are directed to claim 7.

As previously discussed with respect to claim 1 in Section VIII.B, the Examiner has admitted that Logan does not disclose a ceramic disc. However, in a contradictory manner, the Examiner asserts that Logan (item 28) teaches a completed ceramic layer as required by the method of claim 7. The Board is requested to refer to the Applicant's

Rebuttal in Section VIII.B for an explanation as to how Logan and Sun fail to teach or suggest the physical features of the electrostatic chuck of claim 7.

The Applicants point out that the Examiner has rejected claim 7 based on assertions regarding physical characteristics of the electrostatic chuck. Also, the Examiner has based the rejection of claim 7 on reference to features recited in the apparatus of claim 1. The Applicants submit that claim 7 is an independent claim that stands on its own. No reference exists to link claim 7 to claim 1. Furthermore, the Examiner has not provided a basis of rejection for the method operations included in claim 7. The Applicants submit that Logan (column 3 line 39 through column 4 line 59), as referenced by the Examiner, does not provide a teaching or suggestion of the following operational features of the method of claim 7:

- preparing a first disc-shaped ceramic material compact, particularly wherein the first disc-shaped ceramic material compact is characterized as having a thickness equal to half a thickness of a completed ceramic layer
- forming an electrode on a surface of the first ceramic material compact
- preparing a second disc-shaped ceramic material compact having a cooling gas channel on its surface, particularly wherein the second disc-shaped ceramic material compact is characterized as having a thickness equal to half a thickness of the completed ceramic layer
- placing the second ceramic material compact on the first ceramic material compact to form a laminate
- firing the entire laminate to form the completed ceramic layer
- bonding the completed ceramic layer to a metal base plate by means of an adhesive layer.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In accordance with foregoing arguments, the Applicants respectfully submit that the combination of Logan and Sun fails to teach or suggest each and every feature of claim 7 as required to support a rejection under 35 U.S.C. §103(a). Therefore, the Applicants submit that claim 7 is patentable over the cited art of record.

In view of the foregoing, the Board is respectfully requested to overrule the Examiner's rejections of claims 7-8 under 35 U.S.C. §103.

G. Conclusion

In view of the inappropriateness of the 35 U.S.C. §103 rejections, as discussed in the Applicant's aforementioned arguments, the Applicant submits that the presently claimed invention is patentable over the cited art of record.

The Applicant respectfully requests the Board to consider each group of claims (Groups I and II) separately with respect to the teachings of the cited art of record.

In summary, the Applicant submits that the Examiner's rejections are in error, and respectfully requests that the Board of Appeals and Interferences reverse the Examiner's rejections of the claims on appeal.

Respectfully Submitted,
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APPENDIX A

CLAIMS ON APPEAL

1. An electrostatic chuck, comprising:

a metal base plate;

a ceramic disc having a predetermined thickness adhesively bonded to said metal base plate;

a planar electrode positioned in the middle of said ceramic disc relative to a thickness direction of said ceramic disc; and

a cooling gas channel formed on a top surface of said ceramic disc over said electrode and within an outer peripheral edge of said electrode.
2. An electrostatic chuck according to claim 1, wherein said planar electrode extends beyond said cooling gas channel.
3. An electrostatic chuck according to claim 1, wherein said cooling gas channel comprises a ring shape along an outer peripheral edge of said ceramic disc, said chuck further comprising gas feed orifices located in a plurality of positions at a bottom portion of said gas cooling channel and gas feed orifices located in a plurality of positions on a circumference on a surface of said ceramic disc in the center side of the chuck.
4. An electrostatic chuck according to claim 1, wherein said planar electrode includes a first electrode and a second electrode,

said first electrode including,

a disc portion arranged in the center of said ceramic layer, and

a first extending portion extending from a part of the disc portion toward the outer peripheral edge of said ceramic layer,

said second electrode including,

a second extending portion arranged opposite to said first extending portion relative to said disc portion of said first electrode, and

a circular ring portion connected to an outer edge of said second extending portion so as to form the outer peripheral edge of said second electrode.

5. An electrostatic chuck according to claim 4, wherein said first electrode further includes a plurality of first C-shaped ring portions at predetermined intervals so as to have different diameters, the first C-shaped ring portions extending in C shapes from both sides of said first extending portion around said disc portion.

6. An electrostatic chuck according to claim 5, wherein said second electrode further includes a plurality of second C-shaped ring portions at predetermined intervals so as to have different diameters, the second C-shaped ring portions extending in C shapes from both sides of said second extending portion and being engaged with said plurality of first C-shaped ring portions of said first electrode.

7. A method for manufacturing an electrostatic chuck, comprising:
preparing a first disc-shaped ceramic material compact having a half of a thickness of a completed ceramic layer;
forming an electrode on a surface of said first ceramic material compact;

preparing a second disc-shaped ceramic material compact having a half of a thickness of the completed ceramic layer and having a cooling gas channel on its surface in a location overlying said electrode;

placing said second ceramic material compact on said first ceramic material compact so as to form a laminate;

firing the entire laminate to form the completed ceramic layer; and

bonding the completed ceramic layer to a metal base plate by means of an adhesive layer.

8. The method of claim 7, wherein said adhesive layer is flexible.